It shows that the iron oxide under the influence of lime has a disposition to go over into the form of protoxide, and thac in slag II. also, nearly all iron could be reduced to protoxide. The results further show that iron protoxide also is dissolved by ferro-lime slag.

(c) SLAG-FORMING- SUBSTANCES.

Silica and lirne may be regarded, as siiown, as tho moat important slag-forming substances in open-hoarth furnaces, and it is evident that one can facilitate the formation of Blag and conserve the furnace structure if one adds corrosponding amounts of these substances to the charge. It in novortholoas in rare cases necessary to make a special addition of niiica, since this material comes generally in desired and often, unfortunately, even in too large amounts into tho furnace. Tho causes thereof are the following:—

(1.) The metallic charge is always uncleansed from Band, clay, or similarly highly siliceous materials, an pig iron is often cast in sand, which adheres in not inconsiderable quantities to the pieces. The absolute amount of SiOa which in this way reaches the furnace, is naturally very varied, and must be in each ease specially appraised and correspondingly ascertained , . . (30A).

(2.) The metallic addition always contains silicon also, which is combined with the iron. During the process the silicon will be oxidised and go over into silica, and from 1 per cent* silicon there results 2*14 per cent. SiO^ . . . (80n).

(3.) Silica reaches the bath from the acid furnace structure, since the best run furnace wears out by uso, and comes finally to a stop, even if during the entire run of tho furnace a so-called burning of the furnace should not occur. The main roof and a portion of the port block consist of materials which are made from silica with small additions of other materials, and these portions must naturally be so arranged that their material by wearing out, reaches the combustion chamber and must be taken up by the slag. The extent of the quantity of silica which in this way roachon the combustion chamber admits of being estimated on tho basis of the